BOWLING BALL RETENTION DEVICE

Cross Reference To Related Application

This application claims the benefit of United States Provisional Application No. 60/463,302, filed on April 16, 2003, the teachings of which are incorporated by reference.

Field of Invention

This invention relates to the sport of bowling and, more particularly, to the retention of bowling balls from rolling when not in use.

Background of the Invention

Bowling as a game and a sport has been played for centuries. It is the most popular recreational sport in the world and widely practiced by all ages, not just in North America, but in Europe, and with increasing popularity, in Asia. Tenpin bowling is the most common variation of the sport, using a ball which is about 27 inches in circumference and weighing between 6 pounds and 16 pounds.

As a sanctioned sport in North America, there are nearly six million men, women and children who compete, usually on teams of four to five participants, for thirty plus weeks of each year.

The sanctioned version of the sport has very specific rules as to the size and weight of the ball and pins, as well as to the dimensions of the lane surface (width, length, flatness, topography). Most recently, scores from sanctioned leagues have soared as technology has become a large factor. As bowling ball companies seek to sell new equipment, the composition of the outer surface of the ball has changed from rubber to polyester to urethane compositions and, most recently, to urethane compositions having fine plastic or inorganic particles dispersed

in their outer surface. Bowling balls typically have a core material different from the outer surface to allow the manufacturer to provide unequal weighting in the ball (top weight and side weight within allowed limits). The shape of the core of the ball has changed from a large sphere to a pancake to symmetrical high density shapes to, most recently, asymmetric shapes which can greatly affect the ball rotation and break point. All of this technology has increased the ability of the average bowler to throw a ball that "hooks" and knocks down more pins. In addition, the more reactive and particle-filled coverstocks pick up more oil (dressing) from the surface of the lane and transfer it further down the lane or to a bowler's towel when the ball is wiped. In an effort to maintain some consistency on the lane surface, lane mechanics have used more and higher viscosity "oils" across the lane in many varieties of patterns. The oil that is placed on the lane to prevent wear of the wood or plastic lane surface is applied daily by a machine that travels the length of each lane, first stripping off the residual oil from earlier play and then re-applying a new layer. This layer generally extends across the lane and from one-half to two-thirds of the sixty foot (60 ft.) distance from the foul line to the head pin, in a crowned, Christmas tree, flat or other pattern.

This combination of new technology in ball construction and heavier oil pattern has resulted in the necessity to use one type of ball in order to get a strike (one that hooks), sometimes a different ball for a strike on an adjoining lane (which may have different surface conditions), and a harder-surfaced ball to make spares. Often, the bowler must use still another ball for the second and third game of a series as the oil is moved around on the lane surface by multiple competitors.

Most bowling leagues comprise competition between two teams of four to five competitors bowling on two lanes serviced by a single ball return. That ball return has the ability to hold about ten balls safely. As the competitors now need multiple balls with which to effectively compete, the settee area surrounding the ball return becomes scattered with bowling balls, stored on chair seats, on chair backs, tables, the floor, etc. Given the spherical shape of the

ball, they tend to easily roll and present tripping, as well as falling hazards.

What is needed is a bowling ball retention device which can be applied to any flat or slightly inclined surface, near the ball return, on which multiple balls can be placed to prevent them from rolling and further provide an orderly and safe area for the bowlers to compete in.

United States Patent 4,511,140 to Robert L. Wenger is directed at a bowling ball retainer-towel device wherein a loop-shaped annular embossment lies in the plane of a panel-like towel of flexible fabric. The embossment can serve as a raised obstruction to restrain rolling of a bowling ball placed inside. To use the towel, it would seem that one would have to remove the ball from being retained by the loop.

It is the object of the present invention to provide a device for holding a plurality of bowling balls and retain them from freely rolling.

It is further object of the present invention to provide this device in a relatively flat shape capable of being inclined slightly and of being applied to any relatively flat surface around a bowling ball return such as a floor, a table, a shelf, etc.

It is a further object of the present invention to provide a ball retention device which has a plurality of openings, each opening is matched to the shape of the bowling ball such that the retention device carries little or no weight from the ball, but rather prevents rolling of the bowling ball.

It is a further object of the present invention to provide a ball retention device having a plurality of openings that can be simply produced, of low weight and low cost materials, and in a variety of shapes, the shape being configurable to the area of free space around the ball return or settee area.

Summary of the Invention

In a first embodiment, the present invention is directed at a relatively thin and flat sheet of material having a plurality of through-holes spaced about 8.60 inches to 12 inches apart to

hold bowling balls from freely rolling. The sheet of material may be configured to be applied to any relatively flat surface in the area of a bowling ball return in a bowling center, including but not limited to the floor, the lane surface, tables in the settee area, etc.

The relatively thin and flat sheets of material may be of any shape configured to fit around the ball return, etc. including, but not limited to, rectangular, triangular, trapezoidal, circular, horseshoe-shaped, etc.

The present invention is further directed at a sheet of material having a plurality of through-holes sized to hold the bowling ball from rolling but carrying very little of the weight of the ball. The size of the through-holes is determined according to an equation by the thickness of the sheet of material and the diameter (approximately 8.60 inches) of the bowling ball.

Brief Description of the Invention

FIG. 1 is a perspective view of the bowling ball retention device of the present invention.

FIG. 2 is a perspective view of an alternate configuration of the bowling ball retention device of the present invention.

FIG. 3 is a view of a pair of bowling lanes illustrating the ball return area and some possible locations for placement of the bowling ball retention device of the present invention.

Detailed Description of the Preferred Embodiments

As noted above, the present invention is directed at a device for retaining a bowling ball from rolling, comprising a sheet of material having a plurality of through-holes which are sized based on the thickness of the sheet material according to a geometric equation, such that the sheet carries very little of the weight of the bowling ball.

Turning to the drawings, **FIG. 1** illustrates a bowling ball retention device **10** comprising a sheet of relatively thin material, **11**, in this case rectangular in shape, and includes a plurality of through-holes **16**, spaced apart to allow a tenpin bowling ball to fit into each hole without

touching another ball. The sheet of material **11** may be any of a wide variety of low weight and low cost materials, including but not limited to, wood, plastic, plastic foam and the like. Wood and plastic materials are preferred due to their low specific gravity, cost and ease of manufacture. While any type of plastic is suitable for the ball retention device **10**, it is particularly preferred that the plastic be foamed to provide even lower weight and cost and the reduce potential for compression set. While polyurethane, polystyrene, polyethylene and polypropylene foams are suitable, it is most preferred that a cross-linked polyolefin foam be used in manufacturing the ball retention device of the present invention. A cross-linked polyolefin foam that has provided the advantages of the present invention is trademarked Minicell L-380 by Voltek of Lawrence, MA. The sheet of material **11** comprises a top surface **12** separated from a bottom surface **14** to define a thickness **t**. The thickness **t** is kept to a minimum to allow the bowling ball retention device to be manufactured at a relatively low cost and is preferably between about 0.125 inches and 1.000 inches. More preferably, the thickness of the sheet of material **11** is between about 0.375 inches and 0.625 inches and most preferably approximately 0.500 inches. The holes in the sheet, indicated at **16**, are preferably spaced apart on center by a distance greater than the diameter of the bowling ball, approximately 8.60 inches, such that any two bowling adjacent balls don't touch. Generally, it is preferred that the through-holes are spaced apart, as indicated by **A** in FIG. 1 and FIG. 2, at an on-center distance between and including 9.0 inches to 10.5 inches, although greater spacing is possible, but not cost effective in terms of the amount of sheet material used to make the ball retention device.

It is preferred that the bowling ball retention device **10** of the present invention include through-holes **16** in the sheet of material **11** such that the sheet of material **11** carries very little if any of the weight of the ball. This reduces any issue with compression set or wear on the periphery of the hole. The through-holes may be tapered to cradle the ball, but are preferably straight-sided to reduce the cost of formation (routing, punching, die-cutting, forming, etc.). Thus, the ball retention device **10** acts primarily to prevent the bowling ball from rolling rather

than carrying a substantial portion of the ball's weight.

The preferred size of the opening of the through-holes is determined based on the thickness of the sheet of material and the diameter of the ball, for instance, 8.60 inches for Tenpin bowling balls, according to the equation:

$$D = 2 \sqrt{(2 t R - t^2)}$$

where:

$\sqrt{}$ = square root function
D = diameter of the opening in the through-hole in inches
t = sheet thickness in inches
R = bowling ball radius in inches (for instance, 4.30)

This allows the majority of the weight of the bowling ball to be borne by whatever surface the bowling ball retention device is placed upon.

The sheet of material **11** illustrated in FIG. 1 is preferably applied to a flat surface, however, it may be applied to an inclined surface to the extent that the bowling ball does not roll out of the through-hole due to its own weight.

FIG. 2 illustrates an alternate shape for the bowling ball retention device **20** comprising a trapezoidal shape which is an efficient use of space to hold five balls. Here, the hole spacing **A** is preferably about 9.25 inches to 10.00 inches on center for each hole relative to each adjacent hole. This allows some distance between balls so that they can be easily stored and removed without interference or substantial contact with adjacent balls.

FIG. 3 illustrates some preferred placements for various shapes of the ball retention device of the present invention. Here, a ball return **42** which delivers bowling balls **46** to a circular, or in some cases elongated, ball storage device **44** is shown between a pair of bowling lanes **32, 34**. Since the ball storage device **44** is limited as to how many bowling balls **46** it can hold and today's competitors may use two to three balls in a game, the bowling ball retention device of the present invention can provide a safer and neater environment for competition.

Here, three alternate shapes of ball retention device **10, 20** and **30** are illustrated.

Optional shapes for bowling ball retention devices, depending on the free space available around the ball return, include but are not limited to, such areas and shapes as rectangular **10**, trapezoidal **20** and semi-horseshoe-shaped **30**. The retention devices of the present invention can further be embossed, decorated or emblazoned with advertising and logos on the surfaces **12, 14**.

A scoring monitor **48** is also shown containing a pair of screens **50** for displaying the bowling scores.

In an optional embodiment, an additional thin layer of material may be attached to the bottom surface **14** of the sheet of material, **11** to cover the holes and act as an anti-skid or adhesive to attach the retention device **10, 20, 30** to a stationary substrate such as a floor or table. In that case, the through-holes **16** would optionally not extend through the layer of material.

It should be apparent from the above written description and drawings that the present invention provides a low cost, easily manufactured device for preventing bowling balls from rolling and which can be placed near a ball return in a bowling center to provide for safe and convenient storage of additional bowling balls used in competition. Of particular note, is that the plurality of through-holes in the sheet of material which comprises the ball retention device of the present invention are of a diameter that allows the retention device to support very little of the weight of the ball, rather the ball weight is supported by the surface that the ball retention device is applied to.

The description and drawings illustratively set forth the presently preferred invention embodiment. We intend the description and drawings to describe this embodiment and not to limit the scope of the invention. Obviously, it is possible to modify these embodiments while remaining within the scope of the following claims. Therefore, within the scope of the claims one may practice the invention otherwise than as the description and drawings specifically show and describe.